

PATENT
Docket: NISUS-002-PAP

Application No.: 09/160,728
Examiner: Lance W. Sealey, GAU 2772

79. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 78.

80. A method of teaching transformation rules for abstract symbolic statements comprising:

- a) a step for displaying an abstract symbol statement in a first form;
- b) a step for displaying an abstract symbol statement in a second, transformed form; and
- c) a step for animating a transition between the first form and the second, transformed form of the abstract statement.

REMARKS

New Claims 61-80 are presented herein for consideration. No new matter is added. New independent Claim 61 is identical to original Claim 1, now canceled, that was included with the subject application as filed. New independent Claim 63 recites limitations similar to those recited in original Claim 1, and is written in a somewhat different, perhaps more traditional manner. New independent Claim 80 is written in "step plus function" language to deliberately invoke interpretation in accordance with 35 USC 112, sixth paragraph. The remaining new claims are all dependent from one of the above-mentioned independent claims. The patentability of these claims is discussed below by reference to rejections previously asserted by the Examiner against now-canceled claims having similar scope or similar limitations as some present claims.

Patentability of New Claim 61

New independent Claim 61 is identical to Claim 1 as originally filed. New Claim 61 recites:

A method of presenting, on a computer controlled display device,
transformation rules of abstract representations using animations to simulate
continuous transformations.

The Examiner rejected original Claim 1 in the first Office Action in respect of the subject application, mailed August 16, 2000, as anticipated under 35 USC 102(e) by Nakayama. To support that rejection, the Examiner set forth the following rationale (emphasis added):

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"With respect to Claims 1 and 12, Nakayama, in disclosing a calculator with stepwise display of linear equations, also discloses a method of presenting, on a computer controlled display device, transformation rules of abstract representations using animations to simulate continuous transformations, where said presentation is for use in the teaching of said presentation rules (Abstract, first sentence)."

With all due respect to the Examiner, Applicant submits that the Examiner's statement reflects a misunderstanding that has persisted since the beginning of the examination of the present application. This misunderstanding must be dispelled in order to allow a fair evaluation of the patentability of the invention (as presently claimed) to proceed.

Nakayama, either alone or in combination with other prior art that has been cited thus far, does not anticipate or render obvious any of the present claims, and did not anticipate or render obvious any of the previous claims (now canceled), for the following reasons: 1) Nakayama teaches stepwise transformations; 2) stepwise transformations are precisely the art that the Applicant improves upon; 3) stepwise transformations are not animations; and 4) Nakayama does not disclose, teach or suggest animations (as understood in context of the Applicant's specification and employed in the claims), requiring a conclusion that 5) Nakayama does not anticipate the invention claimed in original Claim 1. Moreover, 6) obviousness requires suggestion and motivation to combine known but disparate elements; however, 7) the Examiner has cited no reference that suggests or motivates combining animations and transformations, requiring a conclusion that 8) Nakayama cannot properly be combined with any of the prior art previously cited by the Examiner to render obvious original Claim 1 (present Claim 61) or other claims that include a similar combination of limitations. Each of these reasons is elaborated and supported below.

1. *Nakayama teaches stepwise presentation of transformed symbolic statements:* There should be no dispute on this point. The Examiner's own statement calls Nakayama's technique a

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"stepwise display of linear equations." This fact is apparent from the abstract of Nakayama, and is made abundantly evident throughout the lengthy specification of Nakayama.

2. Stepwise presentation of transformed symbolic statements is precisely the art that the Applicant improves upon: The Applicant's specification clearly distinguishes animations from stepwise presentation of transformed symbolic statements (as is implemented in Nakayama). The Examiner's attention is directed to the text of the subject application between page 1, line 28 and page 2, line 7, which underscores that such stepwise presentations are precisely the background art upon which the present invention improves. That text recites (underlining added for emphasis):

"Although many software programs have been developed to help in the instruction of such subjects, they all present the transformations in discrete steps. The actual transformations have to be inferred from the starting expression followed by the transformed, ending one. Such inference is sometimes difficult for some people to make and requires a visualization of the continuous process.

"For example, the conventional method of illustrating how a mathematical expression is transformed, is to display each step, in a step-by-step process, leaving the previous expression displayed, so the viewer can compare it with the current one and thus deduce the details of the transformation. Unfortunately, many viewers find it difficult to make that deduction, even when this is explained, and this frustrates their understanding."

Thus, it is clear from the Applicant's specification that the "conventional method" that is used in the prior art is a stepwise presentation of transformed symbolic statements. This is precisely the method that Nakayama teaches, and is precisely the method that Applicant's inventive method improves upon.

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3. *Stepwise presentation of transformed symbolic statements are not "animations"*: This statement need only be true for "animations" as understood in the context of the Applicant's specification, because that is the meaning of "animations" for purposes of the present claims. However, Applicant submits that stepwise presentation of transformed symbolic statements are not "animations" in any generally accepted meaning of that term, much less as that term is understood in the context of the Applicant's specification. The meaning of "animations," both generally and in context of the specification, is further discussed below.

A general background meaning of "animation" is provided in dictionaries. For example, The American Heritage Dictionary of the English Language (1979, Houghton Mifflin), defines "animation" in part as: 1. The act, process, or result of animating. ... 3.a. The art and process of preparing animated cartoons. b. An animated cartoon. Further understanding of "animation" may be available in the reference which the Examiner cited: "Computer Graphics: Principles and Practice, Second Edition in C" (Foley et al.) ("Foley"). Nothing in these references, which reflect a general understanding of "animation," suggests that stepwise transformations are animations.

"Animation" as understood in the context of the Applicant's specification, which underlies a proper construction of the scope of the claims, is not contrary to the general understanding provided in many extrinsic references. The meaning of "animation" in this context is informed by the extensive discussion of "animation" throughout the Applicant's specification.

The meaning of "animation" in context may be understood by generalizing all of the descriptions and examples of animation that are presented in the Applicant's specification. The specification (beginning at page 6, line 23) recites "The details of the animation can change from instance to instance, but the principle of animating symbolic representations, in order to make transformations clear, is the basis of the present invention." Animation examples and details appear throughout the specification. Page 7, for example, contains several examples illustrating animation, such as "When the transformation involves the moving of a symbol, this motion

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should be as continuous as possible. Re-drawing the symbol at more intermediate places is the well known method of achieving continuous motion" (page 7 line 2), and "... when both sides of an algebraic equation have just one term each, and both terms have negative signs in front of them, changing both signs can be animated by moving each sign up, above the equation, then towards each other where, as they merge, they annihilate each other" (page 7 line 16).

The examples above give a flavor of the meaning of "animation" in context, but do not constitute a limiting definition. A complete understanding of what is, and what is not, animation in this context can be established by review of the entire text of the application. A definitive definition of the claim term "animation" is a task properly reserved for a litigation proceeding. For present purposes, however, only certain boundaries on the meaning of the term need be established.

For present purposes, the term "animation" as understood in context of Applicant's specification is shown below to be bounded, such that it does not encompass stepwise presentation of transformed symbolic statements. First, stepwise presentation of transformed symbolic statements (as used in Nakayama) does not even meet the generally understood definition of "animations", as indicated by the dictionary definitions quoted above. Moreover, Applicant hereby represents that "animation" (as used in the present claims) does not encompass stepwise presentation of transformed symbolic statements. Further, the examples quoted above show that animation is unlike stepwise presentation of transformed symbolic statements, thus indicating a positive difference between them. Yet further, no example or discussion within the specification indicates that stepwise presentation of transformed symbolic statements constitute an example of animation, thus indicating an absence of contrary suggestion. Finally, the Background section of the application explicitly notes such stepwise presentations as the problem with the prior art that is addressed by the present invention, positively implying that the present invention (based, per specification at page 6 line 23, upon the principle of animating symbolic representations) is different from stepwise presentation of transformed symbolic statements.

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Taken together, the statements and facts set forth above strongly support the assertion that stepwise presentations of transformed symbolic statements are not animations, as that term is understood in the context of the subject application. A complete review of Applicant's specification will further support these statements and facts.

"Animation" as used in the subject application is an adequately clear concept, which may be defined precisely as set forth above, that sufficiently describes the metes and bounds of the claims in which it is used. The preceding remarks establish the existence of boundaries on the meaning of the term "animation" that prevent Claim 1, for example, from encompassing the methods taught in Nakayama. Consequently, no additional limiting language need be applied to the term "animation" as used in the present claims.

4. *Nakayama does not disclose, teach or suggest animations:* The Examiner provides not a scintilla of support for his assertion, quoted above, that the method of Nakayama is an example of "a method of presenting ... transformation rules of abstract representations using animations to simulate continuous transformations." The Examiner does not point to any particular text within Nakayama that describes stepwise presentation of equations as "animations," nor has he provided any evidence that would indicate that stepwise presentation is understood by those skilled in the art to amount to animation. The Examiner cites a general computer animation reference, Foley, but Foley neither teaches nor suggests using animations to simulate continuous transformations, in combination with presenting ... transformation rules of abstract representations. Indeed, the stepwise presentations of Nakayama are contrary to the usual understanding of the term "animation," as reflected in the dictionary definition set forth above. If the Examiner has support for his quoted assertion, he is respectfully requested to identify it with specificity, in conformance with 37 CFR 1.104(c)(2). Otherwise, Applicant respectfully submits that the facts and reasoning set forth above show clearly that Nakayama does not present an example of the method claimed in original Claim 1 (present Claim 61), that Nakayama does not teach animation as understood in context of the Applicant's specification, and that Nakayama does not disclose all of the limitations recited in original Claim 1.

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5. *Nakayama does not anticipate the invention claimed in original Claim 1:* This conclusion follows from the statements set forth above. Nakayama provides an excellent example of what is *not* encompassed in the term animation as used in the present claims. The abstract of Nakayama states (emphasis added): "process equations, obtained by transforming the equations step by step to reach their answers, are successively displayed on a liquid-crystal display screen." This does not disclose animation of the transformation, but rather it describes a method of presenting transformations in discrete steps, each step represented by a complete, static equation. Applicant submits that that the Examiner fails to identify any teaching in Nakayama that constitutes animation.

Because Nakayama fails to teach, describe or suggest the limitations that are clearly conveyed by the language of, for example, original Claim 1 (present Claim 61), Nakayama fails to anticipate the invention claimed in original Claim 1 (present Claim 61).

6. *Obviousness requires suggestion and motivation to combine disparate elements:* It is important to address the standard for obviousness which the Examiner provided to the Applicant in his Advisory Action dated October 23, 2001. In the Advisory Action, the Examiner stated (underlining added for emphasis):

"... the standard for a 103 rejection of a claim is whether a person of ordinary skill in the art could reasonably obtain the invention represented by the claim by combining the inventions in the rejection, not whether the inventors could have envisioned the invention represented by the claim, as the applicant seems to believe."

Every invented combination can, of course, be *reasonably* obtained from combinations of the prior art, because inventors are reasonable people, and thus the standard for obviousness set forth by the Examiner would appear to swallow the whole of patent law. Applicant respectfully identifies a problem with this standard for obviousness, drawing attention to the third subheading of section 2143.01 of the Manual of Patent Examiner Procedure ("MPEP"), which recites

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(original in bold, all capitals): "Fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness."

The Examiner is respectfully reminded of the proper standard for obviousness, a statement of which is provided in the first paragraph of section 2143 of the MPEP, "Basic Requirements of a *Prima Facie* Case of Obviousness", which recites:

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations."

Applicant respectfully submits that the Examiner cannot properly attribute suggestion or motivation to combine animation with symbolic equation transformations to "the knowledge generally available to one of ordinary skill in the art." MPEP 2144.03 states in regard to such assertions: "If the applicant traverses such an assertion the examiner should cite a reference in support of his or her position."

7. *The Examiner has cited no reference that suggests or motivates combining animations and transformations:* Nakayama cannot be properly combined with Foley (or any other reference thus far cited by the Examiner) to establish a *prima facie* case of obviousness for any claim that includes the limitations recited in original Claim 1, because no reference cited thus far provides the suggestion and motivation required by the proper standard for obviousness that is quoted above.

In his second Office Action regarding the subject application, the Examiner asserted that Nakayama and Foley are properly combined to render obvious Claim 41 (submitted in

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Applicant's response dated November 1, 2000, now canceled). Nakayama provides stepwise transformations of symbolic statements, but fails to anticipate even the invention claimed in original Claim 1, not to mention the narrower language of Claim 41, because it contains nothing equivalent to "animation." Foley provides steps for animating computer graphics. Even accepting *arguendo* that Nakayama and Foley disclose all of the elements recited in previous Claim 41, the Examiner still failed to establish a proper *prima facie* case that the references rendered Claim 41 obvious, because he failed to provide any reference that clearly suggests that animation techniques should be applied to methods such as taught by Nakayama.

The subject application, of course, teaches that animation should be applied to transformation steps. However, the material of the subject application is not properly available to the Examiner to show motivation or suggestion of the combination. Use of the Applicant's specification for purposes of showing motivation or suggestion would constitute "improper hindsight."

8. *Nakayama cannot properly be combined with any of the heretofore cited art to render obvious any invention that includes the limitations recited in original Claim 1:* Applicant respectfully submits that no previously cited prior art reference suggests or motivates combining animations and transformations. In this absence, Nakayama cannot be properly combined with *any* reference that merely reveals animation techniques to establish a *prima facie* case of obviousness for original Claim 1, or for any claim including the limitations recited therein, such as (presently canceled) Claim 41 or present Claim 61.

Because the claims presented with this Revival and Continued Prosecution Application are new, there are technically no rejections outstanding. However, the present claims contain limitations that are similar, and in some cases identical, with those that were presented in now-canceled claims that the Examiner previously rejected as either anticipated by, or obvious over, Nakayama. The Examiner is respectfully requested to effectively withdraw those previous rejections based upon Nakayama by refraining from repeating them in regard to the present claims. The remarks set forth above fully warrant a conclusion that such rejections are improper

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and unwarranted. In this regard, the Examiner is reminded of the admonishment of the MPEP (section 706, second paragraph, emphasis added), that " ... the examiner should never overlook the importance of his or her role in allowing claims which properly define the invention."

Patentability of New Claims 62-80

New Claim 62 depends from new Claim 61, and is properly allowable at least for the reasons set forth above. New independent Claim 63 contains limitations, which cause it to be properly allowable over the prior art that has been cited heretofore for the same reasons as provided above with respect to original Claim 1 (present Claim 61). New Claims 64-79 depend, directly or indirectly, from new independent Claim 63, and each adds further limitation to the limitations of new Claim 63 to render each of these claims properly allowable over the previously cited prior art for at least the reasons discussed above with respect to new Claim 63. Finally, new independent Claim 80 includes limitations that would be similar to those recited in present Claim 63, except they are worded in step plus function language. New Claim 80 will therefore be interpreted in accordance with 35 USC 112, paragraph 6. Even with such interpretation, the Examiner should understand that new Claim 80 is properly allowable over the previously cited prior art for reasons similar to those set forth above in regard to original Claim 1 (new Claim 61).

New Claims 62-80 in general are worded somewhat differently than original Claims 2-20. In view of the previous cancellation of Claims 1-20, and the attempted subsequent cancellation of Claims 21-40, these claims seek to present substantially the same subject matter, but written in a format that is better harmonized with typical patent practice. It is stressed that these claims have *not* been narrowed to avoid any of the prior art submitted heretofore by the Examiner, as evidenced by the retention of the original language of Claim 1 as originally filed.

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Allowable Claims

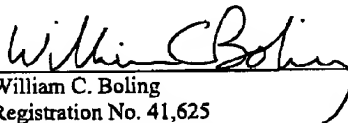
The Applicant respectfully submits that the remarks set forth above, in conjunction with remarks submitted in previous responses, obviate all grounds of rejection previously put forth by the Examiner with regard to claims which, though now canceled, in many cases had limitations or scope similar or identical to present claims. As such, it is respectfully submitted that none of the previous grounds of rejection are adequate to reject the present claims. Because the Examiner relied upon Nakayama to support each previous rejection, a further search may be needed for new prior art that might imaginably anticipate or render obvious the present claims. Barring discovery of such new prior art, the Examiner is respectfully requested to promptly pass this application to issue. The undersigned further respectfully requests the Examiner to contact him in any convenient manner, such as by telephone or e-mail, regarding any remaining issues that the Examiner feels may preclude prompt allowance of the present claims, and that might be resolved or expedited by such contact.

Fees or deficiencies which must be paid to cause the response to be complete and timely filed may be charged, and any overpayments should be credited, to Deposit Account No.: 50-0490.

Respectfully submitted,

9/17/2002

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